

CLAIMS

1. An extrusion die for use in producing perforated stick-type propellant comprising:

- 5 (a) a die blank having a central passage therethrough, said passage having a tapered entry;
- 10 (b) an open lattice webbing structure in said central passage for passing extruding struts in and spanning said central die passage; and
- 15 (c) an array of die pins carried by said webbing structure arranged in a pattern for imparting a pattern of perforations in material forced through said central passage, each pin having a fixed end attached to said lattice structure and a free end extending parallel to said passage beyond said webbing structure.

20 2. An extrusion die as in claim 1 wherein said die is formed as a unitary structure.

3. An extrusion die as in claim 1 wherein said central passage is tapered in the vicinity of said lattice webbing structure.

25 4. An extrusion die as in claim 1 wherein said open lattice structure is machined in said central passage.

5. An extrusion die as in claim 2 wherein said open lattice structure is machined in said central passage.

30 6. An extrusion die as in claim 1 wherein at least some of the pins are formed integrally with said open lattice webbing structure.

35 7. An extrusion die as in claim 4 wherein at least some of the pins are formed integrally with said open lattice webbing structure.

8. An extrusion die as in claim 1 wherein one or more of said pins is separately manufactured and fixed to said lattice webbing structure.

5 9. An extrusion die as in claim 8 wherein separately manufactured pins are press fit into openings provided in said lattice webbing structure.

10. An extrusion die as in claim 1 wherein one or more of said pins is of a non-round cross section.

10 11. An extrusion die as in claim 1 wherein the number of pins arranged in said pattern is selected from 7, 19 and 37 and wherein said pattern includes a central pin.

12. An extrusion die as in claim 11 wherein the number of pins is 7.

15 13. An extrusion die as in claim 4 wherein said machining includes electron discharge machining.

14. An extrusion die as in claim 5 wherein said machining includes electron discharge machining.

20 15. An extrusion die as in claim 1 wherein the area of the open lattice webbing structure is tapered to enhance reforming of extruded material into sticks.